

# LEM

## Ruska Laboratory Environment Monitor

## Technical Data



### Features

- Monitors barometric pressure, temperature, humidity, and air density
- Communicates via RS-232 or RS-485
- Includes software to display all parameters in addition to data logging and calibration
- Precision to 0.1 °C, 0.04 inHg (1.3 mbar) and 3% RH
- Ideal for calibration labs, clean rooms, storage facilities or use with Ruska piston gauges
- Replaces mechanical strip chart recorders

The Laboratory Environment Monitor (LEM) provides the ability to measure barometric pressure, ambient temperature, relative humidity and air density. The LEM transmits these measurements via an RS-232 or RS-485 interface to a PC. The supplied software can then be used to monitor and log all the above parameters for one or up to eight LEMs, simultaneously.

The supplied software allows the LEM to be used as a stand alone instrument and performs a variety of functions, including various units selection, as well as as well as data logging. The LEM is an ideal replacement to older data loggers, such as mechanical strip chart recorders. The software includes options for logging in intervals of one minute, five minutes or 15 minutes. The space delimited text file keeps file sizes small, while allowing easy insertion into spreadsheet applications for data analysis and graphing. The LEM also provides air density measurement—a critical factor for mass calibration labs to correct for air buoyancy effects.

Annual recalibration of the LEM is accomplished through the supplied software. Once calibrated, the new coefficients are downloaded to the LEM and stored in non-volatile memory.

If a barometric pressure accuracy better than 0.04 inHg (1.3 mbar) is required, a variety of digital barometers with an RS-232 interface can be directly connected to the LEM. The LEM will transmit the barometric pressure reading from the external barometer to the PC and LEM software via a single communication link.

The LEM is compatible with a Ruska Model 2456 piston gauge monitor and WinPrompt® software, which automates the operation of the extensive line of Ruska primary pressure standards. The LEM allows WinPrompt to automatically compensate for air buoyancy effects on the mass set of the piston gauge. The LEM is also compatible with the Model 2465 autofloat gas piston gauge.

## Specifications

General specifications	
Units	Temperature: °F or °C
	Pressure: mmHg, cmHg, inHg, kPa, mbar, psi, bar, kg/cm <sup>2</sup>
	Humidity: %RH
	Air Density: g/cm <sup>3</sup> , kg/m <sup>3</sup> , lb/in <sup>3</sup>
Power	10 to 36 V dc, 250 mA maximum (supplied with 115/230 ac adapter). Optional power via RS-485.
Temperature	Operating: 18 °C to 28 °C (64 °F to 82 °F) Storage: -20 °C to 70 °C (-4 °F to 158 °F)
Humidity	5% to 95% RH, non-condensing
Weight	0.23 kg (0.5 lb)
Dimensions (H x W x D)	133.35 mm x 82.55 mm x 31.75 mm (5.25 in x 3.25 in x 1.25 in)
Communications	RS-232 or RS-485
Warm up time	30 minutes
Data update	One second
Range	
Temperature	18 °C to 28 °C (64 °F to 82 °F)
Pressure	20 inHg to 34 inHg (700 mbar to 1150 mbar)
Humidity	5 to 95% RH
Performance	
Precision	Temperature: ± 0.1 °C (32.18 °F)
	Pressure: ± 0.04 inHg (1.3 mbar)
	Humidity: ± 3 % RH
	Precision is defined as the combined effects of linearity, repeatability and hysteresis.
Total uncertainty	Temperature: ± 0.5 °C (32.9 °F) per year
	Pressure: ± 0.08 inHg (2.7 mbar) per year
	Humidity: ± 10% RH per year
Expression of accuracy (uncertainty) conforms with the recommendations of the ISO Guide to the expression of uncertainty in measurement and includes RSS of precision, stability, temperature effects, and the calibration standard to 2 sigma (95%).	
Software	Requires Microsoft® Windows® 95 or higher, 1.6 MB of available hard disk space, 32 MB RAM, RS-232 or RS-485, interface includes extensive help and system manual includes syntax commands.



LEM with Model 2456 and WinPrompt

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Printed in U.S.A. 9/2010 3890714A D-EN-N

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